

**Title 19 - DEPARTMENT OF HEALTH AND SENIOR SERVICES**  
**Division 30 - Division of Regulation and Licensure**  
**Chapter 40 – Comprehensive Emergency Medical Services Systems Regulations**  
**PROPOSED REGULATIONS (March 24, 2010)**

**19 CSR 30-40.XXX Standards for Stroke Center Designation**

*PURPOSE: This rule establishes standards for Level I, II, III and IV stroke center designation.*

**EDITOR'S NOTE:**

*I-R, II-R, III-R or IV-R after a standard indicates a requirement for Level I, II, III, or IV stroke center respectively.*

*I-IH, II-IH, III-IH after a standard indicates an in-house requirement for Level I, II or III stroke center respectively.*

*I-IA, II-IA, III-IA, or IV-IA indicates an immediately (20 minutes) available requirement for Level I, II, III or IV stroke center respectively.*

*I-PA, II-PA, III-PA or IV-PA indicates a promptly (30 minutes) available requirement for Level I, II or III stroke center respectively.*

*PUBLISHER'S NOTE: The Secretary of State has determined that the publication of the entire text of the material which is incorporated by reference as a portion of this rule would be unduly cumbersome and expensive. This material as incorporated by reference in this rule shall be maintained by the agency at its headquarters and shall be made available to the public for inspection and copying at no more than the actual cost of reproduction. This note applies only to the reference material. The entire text of the rule is printed here.*

**(1) General Standards for Stroke Center Designation**

- (A) The hospital board of directors, administration, medical staff and nursing staff shall demonstrate a commitment to quality stroke care. Methods of demonstrating the commitment shall include, but not be limited to, a board resolution that the hospital governing body agrees to establish policy and procedures for the maintenance of services essential for a stroke center; assure that all stroke patients will receive medical care at the level of the hospital's designation; commit the institution's financial, human and physical resources as needed for the stroke program; and establish a priority admission for the stroke patient to the full services of the institution. (I-R, II-R, III-R, IV-R)
- (B) Stroke centers shall agree to accept all stroke patients appropriate for the level of care provided at the hospital, regardless of race, sex, creed or ability to pay. (I-R, II-R, III-R, IV-R)
- (C) The hospital shall demonstrate evidence of a **stroke program**. The stroke program shall be available twenty-four (24) hours a day, seven (7) days a week to evaluate and treat stroke patients and shall meet the following requirements:
  - 1. Maintain a **stroke team** that at a minimum shall consist of: (I-R, II-R, III-R, IV-R)
    - A. A **core team** to provide administrative oversight;
      - (I) A physician experienced in diagnosing and treating cerebrovascular disease, usually the stroke medical director; and
      - (II) At least one other health care professional or qualified individual credentialed in stroke patient care as determined by the hospital, usually the stroke program manager/coordinator;
    - B. A **clinical team** appropriate to the center level designation that may include but not be limited to neurologists, neuro-interventionalists, neurosurgeons, anesthesiologists, intensivists, emergency department physicians, and other stroke center clinical staff when applicable;
  - 2. The stroke team shall **have appropriate skills and proficiencies** in the care of stroke patients. The hospital shall maintain evidence of this by documenting the following: (I-R, II-R, III-R, IV-R)

- A. Stroke team members meet position qualifications and continuing education requirements as outlined in these regulations and by the hospital; (I-R, II-R, III-R, IV-R)
- B. The core team and members of the stroke call roster participate in at least half of the regular, ongoing stroke program peer review meetings as shown in meeting attendance documents; (I-R, II-R, III-R, IV-R)
- C. Stroke team members or liaisons shall participate in at least half of the regular, ongoing stroke program performance improvement and patient safety meetings as shown in minutes and meeting attendance documents. The stroke medical director must ensure and document dissemination of information and findings from the performance improvement and patient safety meetings to the stroke team members; (I-R, II-R, III-R, IV-R)
- D. Stroke team members shall document continued experience in management of sufficient numbers of stroke patients to maintain stroke skills as defined by the hospital, the stroke medical director and these regulations; (I-R, II-R, III-R, IV-R)
- E. Core team members of the stroke call roster in Level I stroke centers shall document a minimum of ten (10) hours of continuing education in cerebrovascular disease every year. All other members of the stroke call roster in Level I stroke centers shall document a minimum average of ten (10) hours of continuing education in cerebrovascular disease every year as determined appropriate by the stroke center medical director and as appropriate to the practitioner's level of responsibility; (I-R)
- F. Core team members of the stroke call roster in Level II stroke centers shall document a minimum of eight (8) hours of continuing education in cerebrovascular disease every year. All other members of the stroke call roster in Level II stroke centers shall document a minimum average of eight (8) hours of continuing education in cerebrovascular disease every year as determined appropriate by the stroke center medical director and as appropriate to the practitioner's level of responsibility; (II-R)
- G. All members of the stroke call roster in Level III and Level IV stroke centers shall document a minimum average of eight (8) hours of continuing education in cerebrovascular disease every other year as determined appropriate by the stroke center medical director and as appropriate to the practitioner's level of responsibility; and (III-R, IV-R)
- H. Stroke team members shall review regional outcome data on quality of patient care as part of the performance improvement and patient safety process; (I-R, II-R, III-R, IV-R)
- 3. Maintain a **multidisciplinary team**, in addition to the stroke team, to support the care of stroke patients; (I-R, II-R, III-R, IV-R)
  - A. The multidisciplinary team shall include an appropriate representative from hospital units as appropriate for care of each stroke patient. The units represented on the multidisciplinary team may include but not be limited to: administration, emergency medical services, intensive care unit, radiology, pharmacy, laboratory, stroke unit, stroke rehabilitation and discharge planning;
  - B. The multidisciplinary team members or representatives shall attend at least half of the stroke program performance improvement and patient safety meetings which shall be documented in meeting minutes and attendance lists.
- (D) The hospital shall provide the services of **neuro-interventional laboratory** staffed by a **neuro-interventional team** that shall be available twenty-four (24) hours a day, seven (7) days a week and consist of, but not be limited to: (I-R/PA)

1. A neuro-interventional specialist(s). The hospital credentialing committee shall document that the neuro-interventional specialist(s) have completed appropriate training and conducted sufficient neuro- interventional procedures to obtain the necessary competence; and
  2. Other health care professionals as deemed necessary.
- (E) The hospital shall appoint a physician to serve as **stroke medical director**; (I-R, II-R, III-R, IV-R)
1. The medical director shall be a board certified or board admissible neurologist or other neuro-specialty trained physician; (I-R)
    - A. Those neurologists or other neuro-specialty trained physicians in the medical director position at the time the regulations take effect or hired within six (6) months of the effective date of these regulations who are not board-certified or admissible shall be able to continue in this position;
    - B. All new stroke medical directors appointed by the hospital effective six (6) months after these regulations take effect shall be board-certified or board-admissible neurologists or other neuro-specialty trained physicians;
  2. The medical director shall be a board certified or board admissible physician with training and expertise in cerebrovascular disease; (II-R)
    - A. Those physicians with training and expertise in cerebrovascular disease in the medical director position at the time the regulations take effect or hired within six (6) months of the effective date of these regulations who are not board-certified or board-admissible shall be able to continue in this position;
    - B. All new stroke medical directors appointed by the hospital effective six (6) months after these regulations take effect shall be board-certified or board-admissible physicians with training and expertise in cerebrovascular disease;
  3. The medical director shall be a board-certified or board-admissible physician; (III-R, IV-R)
    - A. Those physicians in the medical director position at the time the regulations take effect or hired within six (6) months of the effective date of these regulations who are not board-certified or board-admissible shall be able to continue in this position;
    - B. All new stroke medical directors appointed by the hospital effective six (6) months after these regulations take effect shall be board-certified or board-admissible physicians;
  4. The stroke medical director shall have experience in treating stroke patients as evidenced by experience or training in at least one of the following: (I-R, II-R)
    - A. Completion of a stroke fellowship;
    - B. Participation (as an attendee or faculty) in one (1) national or international or two (2) regional or state stroke courses or conferences each year; or
    - C. Five (5) or more peer-reviewed publications on stroke;
  5. The stroke medical director shall meet the following continuing medical education (CME) requirements;
    - A. Twelve (12) hours or more continuing medical education (CME) each year in the area of cerebrovascular disease; (I-R)
    - B. Eight (8) hours or more continuing medical education (CME) each year in the area of cerebrovascular disease; (II-R)
    - C. Eight (8) hours or more continuing medical education (CME) every other year in the area of cerebrovascular disease; (III-R, IV-R)
  6. There shall be a job description and organization chart depicting the relationship between the stroke medical director and other services; (I-R, II-R, III-R, IV-R)

7. It is recommended that the stroke medical director is a member of the stroke call roster; (I-R, II-R, III-R, IV-R)
  8. The stroke medical director shall be responsible for the oversight of the education and training of the medical and clinical staff in stroke care; (I-R, II-R, III-R, IV-R)
  9. The stroke medical director shall participate in the stroke center's research and publication projects. (I-R)
- (F) There shall be a **stroke program manager/coordinator** who is a registered nurse or qualified individual; (I-R, II-R, III-R, IV-R)
1. There shall be a job description and organization chart depicting the relationship between the stroke program manager/coordinator and other services; (I-R, II-R, III-R, IV-R)
  2. The stroke program manager/coordinator shall document a minimum average of ten (10) hours of continuing education each year in cerebrovascular disease as determined appropriate by the stroke center medical director and as appropriate to the practitioner's level of responsibility and attend one (1) national, regional or state meeting every other year in cerebrovascular disease. If the national or regional meeting provides continuing education hours, those hours may count toward the yearly requirement; (I-R)
  3. The stroke program manager/coordinator shall document a minimum average of eight (8) hours of continuing education each year in cerebrovascular disease as determined appropriate by the stroke center medical director and as appropriate to the practitioner's level of responsibility and attend one national, regional or state meeting every three (3) years in cerebrovascular disease. If the national, regional or state meeting provides continuing education hours, those hours may count toward the yearly requirement; (II-R)
  4. The stroke program manager/coordinator shall document a minimum average of eight (8) hours of continuing education in cerebrovascular disease every other year as determined appropriate by the stroke center medical director and as appropriate to the practitioner's level of responsibility; (III-R, IV-R)
  5. The stroke program manager/coordinator shall participate in the formal quality improvement program. (I-R, II-R, III-R, IV-R)
- (G) There shall be a specific and well-organized system for rapidly **notifying and activating the stroke team** to evaluate patients presenting with symptoms suggestive of an acute stroke. (I-R, II-R, III-R, IV-R)
- (H) The hospital shall have a **one-call stroke team activation protocol**. This protocol shall establish the following:
1. The criteria used to triage stroke patients according to time of symptom onset; (I-R, II-R, III-R, IV-R)
  2. The persons authorized to notify stroke team members when a suspected stroke patient is en route or has arrived at the stroke center; (I-R, II-R, III-R, IV-R)
  3. The method for immediate notification and the response requirements for stroke team members when a suspected stroke patient is en route to the stroke center; (I-R/IA, II-R/IA, III-R/IA, IV-R/IA)
  4. All members of the stroke call roster shall comply with the availability and response requirements per the hospital protocol and be in communication within fifteen (15) minutes of notification of the patient. If not on the hospital premises, stroke call roster members shall carry electronic communication devices at all times to permit contact by the hospital. It is

- recommended that one member of the stroke team, per hospital protocol, be at the patient's bedside within fifteen (15) minutes of notification of the patient. (I-R, II-R, III-R, IV-R)
- (I) Stroke centers shall have a call roster providing twenty-four (24) hours a day, seven (7) days a week neurology coverage or regional networking agreement with a Level I or Level II stroke center for telephone consult or telemedicine available within fifteen (15) minutes of notification of patient when a neurologist is not available on site. (I-R, II-R, III-R, IV-R)
- (J) Stroke centers shall have transfer agreements between referring and receiving facilities;
1. The hospital shall have a one-call transfer protocol that establishes the criteria used to triage stroke patients and identifies the persons authorized to notify the designated stroke center; (I-R, II-R, III-R, IV-R)
  2. The hospital shall have a rapid transfer process in place to transport a stroke patient to a higher level of stroke care when needed. (II-R, III-R, IV-R)
- (K) Rehabilitation services shall be directed by a physician with board certification in physical medicine and rehabilitation or by other properly trained individuals (e.g., neurologist experienced in stroke rehabilitation). (I-R, II-R)
- (L) Consults for physical medicine and rehabilitation, physical therapy, occupational therapy and speech therapy shall be requested and completed when deemed medically necessary within twenty-four (24) to forty-eight (48) hours of admission. (I-R, II-R)
- (M) The hospital shall demonstrate that there is a plan for adequate post-discharge and post-transfer follow-up on stroke patients, including rehabilitation and repatriation, if indicated. (I-R, II-R, III-R, IV-R)
- (N) Hospital shall keep a stroke patient log which contains the following: (I-R, II-R, III-R, IV-R)
1. Response times;
  2. Patient diagnosis;
  3. Treatment/actions;
  4. Outcomes;
  5. Number of patients; and
  6. Benchmark indicators;
- (O) There shall be a lighted designated helicopter landing area to accommodate incoming medical helicopters; (I-R, II-R, III-R IV-R)
1. The landing area shall serve as the receiving and take-off area for medical helicopters and shall be cordoned off when in use from the general public to assure its continual availability and safe operation;
  2. It is recommended the landing area be no more than three (3) minutes from the emergency department.
- (P) Each stroke patient who is admitted to a hospital, transferred out of facility, or dies as a result of the stroke, (independent of hospital admission or hospital transfer status) shall be entered into a Missouri stroke registry. The data shall meet the following criteria:
1. Includes at least one (1) code within the range of the following diagnostic codes as defined in the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9)-(CM) 433.01, 433.10, 433.11, 433.21, 433.31, 433.81, 433.91, 434.00, 434.01, 434.11, 434.91, 436.00, 430.00 and 431.00 which is incorporated by reference in this rule as published by the Centers for Disease Control and Prevention in 2006 and is available at National Center for Health Statistics, 1600 Clifton Road, Atlanta, Georgia 30333. This rule does not incorporate any subsequent amendments or additions;

2. The registry shall be submitted electronically in a format defined by the department. Electronic data shall be submitted quarterly, within ninety (90) days after the quarter ends. The stroke registry must be current and complete;
  3. Information provided by hospitals on the stroke registry shall be subject to the same confidentiality requirements and procedures contained in section 192.067, RSMo; (I-R, II-R, III-R, IV-R)
- (Q) A hospital diversion protocol must be maintained in accordance with state regulations. This protocol is designed to allow best resource management within a given area. This protocol must contain a defined performance improvement and patient safety process to review and validate established criteria within that institution. Hospital diversion information must be maintained to include date, length of time and reason for diversion. (I-R, II-R, III-R, IV-R)

## **(2) Medical Staffing Standards for Stroke Center Designation**

- (A) There shall be a delineation of privileges for the neurologists, neurosurgeons and neuro-interventionalists, as applicable, made by the medical staff credentialing committee. (I-R, II-R)
- (B) Physicians who are credentialed by the hospital for stroke care shall be available as indicated. This includes the following:
1. Neurology—available for consultation within fifteen (15) minutes of patient notification; (I-R)
  2. Physician with experience and expertise in diagnosing and treating patients with cerebrovascular disease—available for consultation within fifteen (15) minutes of patient notification; (II-R)
  3. Neurosurgery;
    - A. Neurosurgeon and back-up coverage on the call roster; (I-R/PA)
    - B. Neurosurgeon and back-up coverage on the call roster or available within two (2) hours by transfer agreement if not on staff; (II-R/ PA)
    - C. The neurosurgery staffing requirement may be fulfilled by a surgeon who has been approved by the chief of neurosurgery for care of stroke patients; (I-R, II-R) The surgeon shall be capable of initiating measures to stabilize the patient and perform diagnostic procedures; (I-R, II-R)
  4. Neuro-interventional specialist; (I-R/PA)
  5. Emergency department physician; (I-R/IH, II-R/IH, III-R/IH; IV-R/IA)
  6. Internal medicine; (I-R/PA, II-R/PA, III-R/PA)
  7. Diagnostic Radiology; and (I-R/IA, II-R/IA, III-R/IA)
  8. Anesthesiology; (I-R/PA, II-R/PA)
    - A. Anesthesiology staffing requirements may be fulfilled by anesthesiology residents or certified registered nurse anesthetists (CRNA), or anesthesia assistants capable of assessing emergent situations in stroke patients and of providing any indicated treatment including induction of anesthesia. When anesthesiology residents, anesthesia assistants or CRNA's are used to fulfill availability requirements, the staff anesthesiologist on call will be advised and promptly available and present for all operative interventions and emergency airway conditions. The CRNA may proceed with life preserving therapy while the anesthesiologist is en route under the direction of the neurosurgeon, including induction of anesthesia.

### **(3) Standards for Hospital Resources and Capabilities for Stroke Center Designation**

- (A) The hospital shall meet emergency department standards for stroke center designation.
1. The emergency department staffing shall ensure immediate and appropriate care of the stroke patient; (I-R, II-R, III-R, IV-R)
    - A. The medical director of the emergency department shall be board-certified or board-admissible in emergency medicine; (I-R)
      - (I) Those emergency medicine physicians in the position at the time the regulations take effect or hired within six (6) months of the effective date of these regulations who are not board-certified or board-admissible shall be able to continue in this position;
      - (II) All new medical directors appointed by the hospital effective six (6) months after these regulations take effect shall be board-certified or board-admissible in emergency medicine;
    - B. The medical director of the emergency department shall be a board-certified or board-admissible physician; (II-R, III-R, IV-R)
      - (I) Those physicians in the position at the time the regulations take effect or hired within six (6) months of the effective date of these regulations who are not board-certified or board-admissible shall be able to continue in this position;
      - (II) All new medical directors appointed by the hospital effective six (6) months after these regulations take effect shall be a board-certified or board-admissible physician;
    - C. There shall be an emergency department physician competent in stroke care covering the emergency department twenty-four (24) hours a day, seven (7) days a week; (I-R/IH, II-R/IH, III-R/IH, IV-R/IA)
    - D. The emergency department physician that provides coverage shall be current in cerebrovascular CME and each physician:
      - (I) Shall document a minimum average of four (4) hours of CME in cerebrovascular disease every year; (I-R, II-R)
      - (II) Shall document a minimum average of six (6) hours of CME in cerebrovascular vascular disease every other year; (III-R, IV-R)
    - E. There shall be a written policy defining the relationship of the emergency department physicians to other physician members of the stroke team; (I-R, II-R, III-R, IV-R)
    - F. At a minimum, all registered nurses assigned to the emergency department shall be trained in stroke nursing (including National Institute of Health Stroke Scale (NIHSS), and thrombolytic therapy with NIHSS certification recommended in Level I centers by the hospital within one (1) year of assignment; (I-R, II-R, III-R, IV-R)
      - (I) Registered nurses shall document a minimum of four (4) hours of cerebrovascular disease continuing education every year; (I-R, II-R)
      - (II) Registered nurses shall document a minimum of six (6) hours of cerebrovascular disease continuing education every other year; (III-R, IV-R)
      - (III) Registered nurses shall maintain core competencies in the care of the STEMI patient yearly as determined by the hospital; (I-R, II-R, III-R, IV-R)
    - G. The emergency department shall have written care protocols for triage and treatment of acute stroke patients available to emergency department personnel and should be reviewed annually and revised as needed; (I-R, II-R, III-R, IV-R)

2. The emergency department shall have the following equipment for resuscitation and life support available:
    - A. Airway control and ventilation equipment including laryngoscopes, endotracheal tubes, bag-mask resuscitator, sources of oxygen and mechanical ventilator; (I-R, II-R, III-R, IV-R—except mechanical ventilator not required at IV)
    - B. Suction devices; (I-R, II-R, III-R, IV-R)
    - C. Electrocardiograph (ECG), cardiac monitor and defibrillator; (I-R, II-R, III-R, IV-R)
    - D. Central line insertion equipment; (I-R, II-R, III-R)
    - E. All standard intravenous fluids and administration devices including intravenous catheters and intraosseous; (I-R, II-R, III-R, IV-R)
    - F. Drugs and supplies necessary for emergency care; (I-R, II-R, III-R, IV-R)
    - G. Two-way communication link with emergency medical service (EMS) vehicles; (I-R, II-R, III-R, IV-R)
    - H. End-tidal carbon dioxide monitor; and (I-R, II-R, III-R, IV-R)
    - I. Temperature control devices for patient and resuscitation fluids; (I-R, II-R, III-R, IV-R)
  3. There shall be documentation that all equipment is checked according to the hospital preventive maintenance schedule. (I-R, II-R, III-R, IV-R)
- (B) The hospital shall have a designated intensive care unit (ICU) for stroke center designation; (I-R, II-R)
1. The intensive care unit shall ensure staffing to provide appropriate care of the stroke patient; (I-R, II-R)
    - A. There shall be a designated medical director for the ICU who has twenty-four (24) hours a day, seven (7) days a week access to a physician knowledgeable in stroke who meets the continuing education requirements in these regulations; (I-R, II-R)
    - B. A physician who is not the emergency department physician shall be on duty in the intensive care unit or available twenty-four (24) hours a day, seven (7) days a week; (I-R/IA, II-R/IA)
    - C. The registered nurse/patient ratio used for critically ill patients requiring ICU level care shall be one to one (1:1) or one to two (1:2); (I-R, II-R)
    - D. Registered nurses shall have a minimum of ten (10) hours of cerebrovascular related continuing education per year as determined appropriate by the stroke center medical director and as appropriate to the practitioner's level of responsibility; (I-R)
    - E. Registered nurses shall have a minimum of eight (8) hours of cerebrovascular related continuing education per year as determined appropriate by the stroke center medical director and as appropriate to the practitioner's level of responsibility; (II-R)
    - F. Registered nurses shall meet core credentials for care of stroke patients on a yearly basis in a manner determined by the hospital, including, but not limited to: (I-R, II-R)
      - (I) Care of patients after thrombolytic therapy;
      - (II) Treatment of blood pressure abnormalities with parenteral vasoactive agents;
      - (III) Management of intubated/ventilated patients;
      - (IV) Detailed neurologic assessment and scales; (i.e. NIHSS, GCS)
      - (V) Care of patients with intracerebral hemorrhage and subarachnoid hemorrhage at all Level I centers and all Level II centers with neurosurgical capability;
      - (VI) Function of ventriculostomy and external ventricular drainage apparatus in all Level I centers and all Level II centers with neurosurgical capability;

- (VII) Treatment of increased intracranial pressure in all Level I centers and all Level II centers with neurosurgical capability;
2. The intensive care unit shall have written care protocols for identification and treatment of acute stroke patients available to ICU personnel and should be reviewed annually and revised as needed; (I-R, II-R)
  3. There shall be beds for stroke patients or comparable level of care provided until space is available in the intensive care unit; (I-R, II-R)
  4. **Equipment** for resuscitation and to provide life support for the stroke patient shall be available for the intensive care unit. This equipment shall include, but not be limited to: (I-R, II-R)
    - A. Airway control and ventilation equipment including laryngoscopes, endotracheal tubes, bag-mask resuscitator, and a mechanical ventilator;
    - B. Oxygen source with concentration controls;
    - C. Cardiac emergency cart, including medications;
    - D. Telemetry, ECG capability, cardiac monitor and defibrillator;
    - E. Electronic pressure monitoring and pulse oximetry;
    - F. End-tidal carbon dioxide monitor;
    - G. Patient weighing devices;
    - H. Drugs, intravenous fluids and supplies; and
    - I. Intracranial pressure monitoring devices;
  5. There shall be documentation that all equipment is checked according to the hospital preventive maintenance schedule. (I-R, II-R)
- (C) The **stroke unit** in a Level I and Level II stroke center and the designated stroke beds of a Level III stroke center that keeps patients under a supervised relationship with a Level I or Level II stroke center shall have the following personnel and equipment: (I-R, II-R, III-R)
1. There shall be a designated medical director who meets the continuing educational requirements in these regulations; (I-R, II-R, III-R)
  2. A physician who is not the emergency department physician shall be on duty or available twenty-four (24) hours a day, seven (7) days a week; (I-R/IA, II-R/IA, III-R/IA)
  3. Registered nurses and other essential personnel on duty twenty-four (24) hours a day, seven (7) days a week; (I-R, II-R, III-R)
  4. Registered nurses shall document a minimum of ten (10) hours of cerebrovascular disease continuing education per year as determined appropriate by the stroke center medical director and as appropriate to the practitioner's level of responsibility; (I-R)
  5. Registered nurses shall document a minimum of eight (8) hours of cerebrovascular disease continuing education per year as determined appropriate by the stroke center medical director and as appropriate to the practitioner's level of responsibility; (II-R)
  6. Registered nurses shall document a minimum of eight (8) hours of cerebrovascular disease continuing education every other year as determined appropriate by the stroke center medical director and as appropriate to the practitioner's level of responsibility; (III-R)
  7. Registered nurses shall be credentialed yearly as determined by the hospital; (I-R, II-R, III-R)
  8. There shall be written care protocols for identification and treatment of acute stroke patients (e.g. lytic and post-lytic management, hemorrhagic conversion according to current best evidence) available to personnel and should be reviewed annually and revised as needed; (I-R, II-R, III-R)
  9. Equipment for resuscitation and to provide supports for the stroke patient including, but not limited to: (I-R, II-R, III-R)

- A. Airway control and ventilation equipment including laryngoscopes, endotracheal tubes of all sizes, bag-mask resuscitator and sources of oxygen;
  - B. Suction devices;
  - C. Telemetry, electrocardiograph, cardiac monitor and defibrillator;
  - D. All standard intravenous fluids and administration devices and intravenous catheters; and
  - E. Drugs and supplies necessary for emergency care;
10. Documentation that all equipment is checked according to the hospital preventive maintenance schedule. (I-R, II-R, III-R)
- (D) Radiological and diagnostic capabilities for stroke center designation including a mechanism for prioritization of stroke patients and timely interpretation to aid in patient management shall include:
- 1. Angiography with interventional capability available twenty-four (24) hours a day, seven (7) days a week; (I-R/PA)
  - 2. Cerebroangiography technologist on call and available twenty-four(24) hours a day, seven (7) days a week within sixty (60) minutes for routine procedures and within thirty (30) minutes for emergent procedures; (I-R)
  - 3. In-house computerized tomography; (I-R/IA, II-R/ IA, III-R/ IA)
  - 4. Computerized tomography perfusion; (I-R /IA)
  - 5. Computerized tomography angiography; (I-R /IA)
  - 6. Computerized tomography technologist; (I-R/IH, II-R/IH, III-R/IA)
  - 7. Magnetic resonance imaging; (I-R, II-R)
  - 8. Magnetic resonance angiogram/magnetic resonance venography; (I-R, II-R)
  - 9. Magnetic resonance imaging technologist on call and available twenty-four (24) hours a day, seven (7) days a week within sixty (60) minutes; (I-R, II-R)
  - 10. Extra cranial ultrasound; (I-R, II-R)
  - 11. Equipment and clinical staff to evaluate for vasospasm available within sixty (60) minutes for routine evaluation and within thirty (30) minutes for emergent evaluation; (I-R)
  - 12. Trans thoracic echo; (I-R, II-R)
  - 13. Trans esophageal echo; (I-R, II-R)
  - 14. Resuscitation equipment available to the radiology department; (I-R, II-R, III-R)
  - 15. Adequate physician and nursing personnel available with monitoring equipment to fully support the acute stroke patient and provide documentation of care during the time the patient is physically present in the radiology department and during transportation to and from the radiology department; and (I-R, II-R, III-R)
  - 16. There shall be documentation that all equipment is checked according to the hospital preventive maintenance schedule. (I-R, II-R)
- (E) The operating room personnel, equipment and procedures of all Level I stroke centers and all Level II stroke centers with neurosurgical capability shall include, but not be limited to:
- 1. An operating room staff available twenty-four (24) hours a day, seven (7) days a week; (I-R/PA, II-R/PA)
  - 2. Equipment including, but not limited to:
    - A. Operating microscope; (I-R, II-R)
    - B. Thermal control equipment for patient and resuscitation fluids; (I-R, II-R)
    - C. X-ray capability; (I-R, II-R)
    - D. Instruments necessary to perform an open craniotomy; (I-R, II-R)

- E. Monitoring equipment; and (I-R, II-R)
- F. Resuscitation equipment available to the operating room; (I-R, II-R)
- 3. There shall be documentation that all equipment is checked according to the hospital preventive maintenance schedule. (I-R, II-R)
- (F) The hospital shall meet **post-anesthesia recovery room** (PAR) standards for stroke center designation; (I-R, all Level II stroke centers with neurosurgical capability-R)
  - 1. Registered nurses and other essential personnel who are not on duty shall be on call and available within sixty (60) minutes twenty-four (24) hours a day, seven (7) days a week;
  - 2. Registered nurses shall maintain core competencies yearly as determined by the hospital.
  - 3. Equipment for resuscitation and to provide life support for the stroke patient shall include, but not be limited to:
    - A. Airway control and ventilation equipment including laryngoscopes, endotracheal tubes of all sizes, bag-mask resuscitator, sources of oxygen and mechanical ventilator; (I-R, II-R)
    - B. Suction devices; (I-R, II-R)
    - C. Telemetry, ECG capability, cardiac monitor and defibrillator; (I-R, II-R)
    - D. All standard intravenous fluids and administration devices, including intravenous catheters; and (I-R, II-R)
    - E. Drugs and supplies necessary for emergency care; (I-R, II-R)
  - 4. There shall be documentation that all equipment is checked according to the hospital preventive maintenance schedule. (I-R, II-R).
- (G) The following clinical laboratory services shall be available twenty-four (24) hours a day, seven (7) days a week with timely availability of results; (I-R, II-R, III-R, IV-R)
  - 1. Standard analyses of blood, urine and other body fluids; (I-R, II-R, III-R, IV-R)
  - 2. Blood typing and cross-matching; (I-R, II-R, III-R)
  - 3. Coagulation studies; (I-R, II-R, III-R, IV-R)
  - 4. Comprehensive blood bank or access to a community central blood bank and adequate hospital blood storage facilities; (I-R, II-R, III-R)
  - 5. Blood bank or access to a community central blood bank and adequate hospital blood storage facilities; (IV-R)
  - 6. Blood gases and pH determinations; (I-R, II-R, III-R, IV-R)
  - 7. Blood chemistries; and (I-R, II-R, III-R, IV-R)
  - 8. Written policy that the stroke patient receives priority. (I-R, II-R, III-R, IV-R)
- (H) There shall be documentation of adequate **support services** in assisting the patient's family from the time of entry into the facility to the time of discharge. (I-R, II-R, III-R, IV-R)
- (I) The hospital shall have a **stroke rehabilitation program** or a referral plan. (I-R, II-R, III-R)

#### **(4) Standards for Hospital Performance Improvement, Patient Safety, Outreach, Public Education and Training Programs for Stroke Center Designation**

- (A) There shall be an **ongoing performance improvement and patient safety program** designed to objectively and systematically monitor, review and evaluate the quality, timeliness and appropriateness of patient care, pursue opportunities to improve patient care and resolve identified problems; (I-R, II-R, III-R, IV-R)
  - 1. All stroke centers shall collect, trend and electronically report to the Department key data indicators as identified by the department, including but not limited to: (I-R, II-R, III-R, IV-R)

- A. Door to needle time; (I-R, II-R, III-R)
- B. Percentage of patients presenting within the treatment window; and (I-R, II-R, III-R)
- C. Percentage of eligible patients treated with thrombolytics; (I-R, II-R, III-R)
2. A regular morbidity and mortality review, at least quarterly; (I-R, II-R, III-R, IV-R)
3. Regular reviews of the reports generated by the department from the Missouri stroke registry; (I-R, II-R, III-R, IV-R)
4. Regular reviews of pre-hospital stroke care including inter-facility transfers; (I-R, II-R, III-R, IV-R)
5. Participation in EMS regional system of stroke care as established by the department; (I-R, II-R, III-R, IV-R)
6. Stroke patients receiving FDA-approved thrombolytic (“drip and ship”) remaining greater than ninety (90) minutes at the referring hospital prior to transfer will be reviewed as a part of the performance improvement and patient safety program; (I-R, II-R, III-R)
7. Stroke patients not receiving FDA-approved thrombolytic remaining greater than sixty (60) minutes at the referring hospital prior to transfer will be reviewed as a part of the performance improvement and patient safety program; (II-R, III-R, IV-R).
8. The receiving hospital shall provide and monitor timely feedback to the EMS providers and referring hospital, if involved. This feedback shall include, but not be limited to, diagnosis, treatment and disposition. It is recommended that the feedback be provided within seventy-two (72) hours of admission to the hospital. (I-R, II-R, III-R, IV-R) When EMS does not provide patient care data on patient arrival or in a timely fashion (recommended within three (3) hours of patient delivery), this time frame shall not apply; and
9. Review and monitor the core competencies of the physicians, practitioners and nurses. (I-R, II-R, III-R, IV-R)
- (B) A **neurology clinical support program** shall be established that provides physicians in the outlying region with telephone (or telemedicine) access to a neurologist twenty-four (24) hours a day, seven (7) days a week; (I-R, II-R)
- (C) A **patient and public education program** shall be established to promote stroke prevention and signs and symptoms awareness; (I-R, II-R, III-R, IV-R)
- (D) A **professional education outreach program** shall be established in the region and outlying areas to provide training and other supports to improve care of stroke patients; (I-R, II-R, III-R)
- (E) A **training program** on caring for stroke patients shall be established for professionals in the stroke center; (I-R, II-R, III-R, IV-R)
  1. There shall be a hospital-approved procedure for training nurses and clinical staff to be credentialed in stroke care;
  2. The stroke center shall have a mechanism to assure that all nurses providing care to stroke patients shall complete a minimum of required continuing education to become credentialed in stroke care as stated in these regulations; and
  3. The content and format of any stroke continuing education courses developed and offered by a hospital shall be developed with the oversight of the stroke medical director. A copy of the course curriculum used shall be filed with the department.
- (F) The hospital shall be actively involved in local and regional **EMS systems** by providing **training** and clinical educational resources. (I-R, II-R, III-R, IV-R)

**(5) Standards for the Programs in Stroke Research for Stroke Center Designation**

- (A) The hospital and its staff shall support an ongoing research program in stroke as evidenced by any of the following: production of evidence based reviews of stroke program's process and clinical outcomes; publications in peer reviewed journals; reports of findings presented at regional, state or national meetings; receipt of grants for study of stroke care; or participation in multi-center studies. (I-R)
- (B) The hospital shall agree to cooperate and participate with the DHSS in conducting epidemiological studies and individual case studies for the purpose of developing stroke prevention programs. (I-R, II-R, III-R, IV-R)